

CONCURRENCE SHEET

1. DATE:

03/08/02

1a. CAITS CONTROL NO.:

02-DA01-0242

2. SUBJECT (Or brief description):

National Environmental Policy Act (NEPA) and NPG 8580.1

3. ADDRESSED TO: A. G. Stephenson

4. NAME OF ORIGINATING DIVISION OR OFFICE AND PHONE NO.:

SMS 3/22/02

Allen Elliott 3/8/02

AD10/Allen Elliott/4-4246

5. APPROVAL OF DIRECTOR, CHIEF OR
AUTHORIZED REPRESENTATIVE:

SIGNATURE AND DATE

6. CONCURRENCES:

DIVISION OR OFFICE

SIGNATURE OF DIRECTOR, CHIEF
AUTHORIZED REPRESENTATIVE

DATE

AD20/Edwin Jones

TD01/Denny Kross

LS01/Bill Hicks

AD01/Sheila S. Cloud

DA01/Sackheim

DE01

3-12-02

3-13-02

3/21/02

3/22/02

3/25/02

3/28/02

7. REMARKS / COMMENTS:

FINAL

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

National Environmental Policy Act; Propulsion Research Laboratory

AGENCY: National Aeronautics and Space Administration (NASA)

ACTION: Finding of No Significant Impact

SUMMARY: Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended in 42 U.S.C. 4321, et seq., the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR parts 1500 -1508), and NASA policy and procedures (14 CFR part 1216 subpart 1216.3), and based on the analyses in the Environmental Assessment (EA), the National Aeronautics and Space Administration (NASA) has made a Finding of No Significant Impact (FONSI) with respect to the proposed Propulsion Research Laboratory (PRL) action. The action involves the construction and operation of the PRL to support the research of sub-scale advanced propulsion technologies. As NASA's Center of Excellence for space propulsion, Marshall Space Flight Center's (MSFC) goals are to develop and maintain NASA's pre-eminence in space propulsion and to lead research and development of space transportation technologies and systems. The PRL will be constructed on a 21-acre site at MSFC, located within the boundaries of Redstone Arsenal, in Huntsville, Alabama.

DATE: March 2002

ADDRESSES: To receive a copy of the Final EA, contact Mr. Allen Elliott, Deputy Manager, Environmental Engineering Department, NASA Marshall Space Flight Center, AD10, Marshall Space Flight Center, AL 35812, Phone: (256) 544-0662, Email: Allen.Elliott@msfc.nasa.gov.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTAL INFORMATION: NASA has reviewed the EA prepared for the PRL and has determined that it represents an accurate and adequate analysis of the scope and level of associated impacts. The EA is hereby incorporated by reference in this FONSI.

The action proposed by NASA MSFC and evaluated in the EA is the construction and operation of the PRL to support the research of sub-scale advanced propulsion technologies. As NASA's Center of Excellence for space propulsion, MSFC's goals are to develop and maintain NASA's pre-eminence in space propulsion and to lead the research and development of space transportation technologies and

systems. Two alternatives were evaluated: Alternative A: No Action and Alternative B: Construction and Operation of the PRL at the preferred location.

In the No Action alternative, Alternative A, research activities at MSFC would continue without the benefits of the new PRL. Propulsion research would continue in four separate buildings, which have been modified to function as laboratories and work areas but are not fully adequate in these roles. The proposed location for the new PRL would continue to function as pastureland. The CEQ guidelines for implementing NEPA requirements require inclusion of the "No Action Alternative" as a baseline.

In implementation of Alternative B, both the baseline and future phases of the PRL would be constructed and operated at the preferred location at MSFC. The size of the initial phase of the PRL would be approximately 107,000 gross square feet (approximately 66,000 usable square feet). The baseline phase would contain laboratories, core groups of support functions, and administrative areas. Future phases will be based on unique requirements determined by successful experiment results.

Table 1 and the following paragraphs summarize the effects of each alternative on specific resource areas.

In general, implementation of Alternative A would present no effects to resources at the PRL site or MSFC. Activities and research at MSFC would continue at the Center with no changes.

Implementation of Alternative B would have no impact on cultural resources, the geographical setting, climate, designated land use, biological resources, or sociological environment. It would have a minimal impact on facilities and infrastructure, air quality, water resources, geology, hazardous materials and hazardous waste, and health and safety.

Some additional issues for the construction and operation of the PRL are explosive hazards and radiation hazards. The Chemical Synthesis Laboratory will be built to protect against a worst case explosion equivalent of 1 pound of TNT. During the operation of the PRL, there are five activities that have radiation. These are transportation of antimatter; the Antimatter Research Laboratory; the Beamed Energy Research Laboratory; the Central Diagnostics Laboratory; and the operation of Fusion experiments.

- The amounts of antimatter to be transported are very small and the planned maximum of 10^{10} antiprotons constitutes only 0.00000000000002 gram. At a distance of 2 meters, this would result in 80 millirem of radiation and at a distance of 5 meters this would drop to 13 millirem. The inclusion of planned shielding will further reduce these. To place these numbers in context, a single dental x-ray results in a radiation dose of about 50 millirem, and a typical person in the U.S. receives about 300 millirem per year from natural and man-made sources. Therefore, the impact of transportation of antimatter is minimal.
- The potential for gamma radiation exposure from the operation of the Antimatter Research Laboratory is similar to the potential for exposure during transportation and the potential for doses would be the same. The dose to a member of the public, and/or the effect of the radiation exposure on the environment, would be negligible.
- No radioactive materials are used in the Beamed Energy Laboratory and none are released to the environment. X-ray machines in this lab would have built-in shielding to protect the workers and there would be no measurable exposure to these x-rays in the hallway. The shielding effect from intervening walls and the distance between the target and the hallway would be sufficient to keep doses in the hallway below conventionally measurable levels.
- The Central Diagnostics Laboratory would also have x-ray machines and sealed neutron sources such as an Americium-241 and Beryllium source. Protection from the radiation emitted by a sealed source is accomplished by shielded containers during storage and by portable shielding on a case-by-

case basis. The storage shielding, or the temporary shielding employed during use, would be sufficient to ensure that there would be no measurable dose to the public or to the environment.

- Direct radiation exposure could occur during operations of the fusion experiments from x-ray, gamma, and neutron radiation released during fusion or after operations from the activation products from neutron exposure. Strategic shielding within the laboratory and the distance from the source to the hallway would reduce the dose outside of the laboratory to sub-natural background levels. Since this location occurs inside of the laboratory, the effect on the public and the environment would be minimal.

Table 1
Summary Comparison of Effects of Alternatives A & B on Resource Areas

Issues	Alternative A	Alternative B	Mitigation
Land Use	No effects	No effects – proposed use consistent with the current designated land use map approved by the MSFC Facility Utilization Review Board.	None Required.
Water Supply	No effects	Minimal – would require addition of water connections, but capacity available for potable and industrial network.	None Required.
Wastewater	No effects	Minimal – would require addition of sanitary sewer connections; however, existing network and treatment facility has adequate capacity.	None Required.
Solid Waste	No effects	Minimal – MSFC's solid waste generation would slightly increase; however, existing capacity is available.	None Required.
Transportation	No effects	Minimal – it is anticipated that the number of trips would slightly increase on Morris Road; a southbound turn lane may be constructed to enhance traffic flow for MSFC personnel and tour buses.	A left turn lane into the PRL site may need to be constructed on Morris Road to enhance traffic flow.
Energy	No effects	Minimal – the electrical power systems have adequate electricity supply; a substation would be constructed on site at edge of floodplain.	None Required.
Communication Lines	No effects	Minimal – would require the addition of communication lines; however, communication service is adequate.	None Required.
Permits	No effects	Minimal – the existing NRC license will require amending and the Title V Air Permit will potentially require amending.	None Required.
Air Quality	No effects	Minimal – would not impact the Title V status, nor NSPS or PSD requirements; dust would be suppressed during construction by water application.	Dust control by applying water to all areas subject to dust generation during construction.
Water Resources	No effects	Minimal – would institute stormwater management due to the increase in impermeable area; no effects would occur to groundwater quantity or quality or to the 100-year floodplain.	Will obtain NPDES stormwater construction permit. Shallow swales and erosion controls will be applied.
Geology	No effects	Minimal – stresses would be minimized on the subsurface; would minimally effect water table recharge and elevation.	Signs of subsidence, adequate ventilation, and seismic stresses will be monitored during construction.
Hazardous Materials and Hazardous Waste	No effects	Minimal – existing tracking and disposal procedures would be followed for hazardous materials and hazardous waste; however, the increased quantities would be minimal; existing management and reporting procedures and the Consolidated Environmental Response Plan would be updated.	MSFC's Consolidated Environmental Response Plan may require revisions to address tanks at the PRL.
Biological Resources	No effects	No effects – ecological value may increase due to landscaping undeveloped areas.	None Required.
Cultural Resources	No effects	No effects – no intact cultural resources were discovered during the archeological survey. Structures in the vicinity of the proposed PRL are not anticipated to be determined	None Required.

Issues	Alternative A	Alternative B	Mitigation
		eligible to the NRHP based on their architectural qualities. The proposed PRL project would therefore not result in adverse effects to these structures.	
Health and Safety	No effects	Minimal – building design and material use limitations should address effects of explosive operations. Sources of radiation that will be in the PRL have been identified. However, impacts would be minimized by shielding, distance, and dose (measuring and monitoring).	Explosive design specifications and the volume of explosive's material allowed in the building will be restricted.
Sociological	No effects	No effects – future experiments planned at the PRL will either meet MSFC noise limits of the site location or be moved to the MSFC test area, which allows higher noise levels. Environmental justice, population, economics, Native American concerns, quality of life, or public safety not impacted.	Noise will be monitored to determine actual noise levels produced by testing.

On the basis of the PRL EA, NASA has determined that the environmental impacts associated with the construction and operation of the PRL would not have a significant impact on the quality of the human environment. In the Draft FONSI, this determination was conditional upon the results of the archeological survey. New South Associates completed an archeological survey of the entire 21-acre proposed site in January 2002. No archeological remains were found. Shovel testing exposed a shallow plowzone overlying sterile subsoil and heavy disturbance in the filled-in borrow pit area. No cultural material was observed on the ground surface in areas lacking ground cover. The survey report concluded that the construction of the proposed PRL should have no adverse impacts to cultural resources. A copy of the archeological survey was provided to the Alabama State Historic Preservation Office.

A.G. Stephenson

Director

George C. Marshall Space Flight Center

National Aeronautics and Space Administration

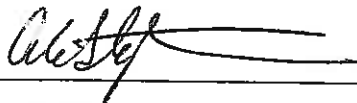
Date Issued: March 2002

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